

REMARKS

Reconsideration of this Application is respectfully requested. Claim 5 is amended, without prejudice or disclaimer. New Claim 6 is added. Claims 1-6 are now in this case.

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Initially in the Office Action, the Examiner advised that Applicant's Declaration of inventorship is defective on grounds that it fails to identify the Application by Application Number and filing date. Also, the Examiner explains, the Declaration does not make reference to the PCT Application Number.

Accordingly, Applicant submits herewith a newly executed Declaration And Power Of Attorney which identifies the PCT parent Application, as well as the Application Number and filing date. Applicant respectfully notes that, contrary to the Examiner's suggestion in the Detailed Action that priority was not properly claimed, Applicant respectfully states that such PCT Application was identified throughout Applicant's initial filing transmittal documents, including his Transmittal Letter To The United States Designated/Elected Office (DO/EO/US) Concerning A Submission Under 35 U.S.C. 371 (Form PTO-1390), and Letter Re Priority.

Withdrawal of the Examiner's objection, in this regard, is respectfully requested.

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The Examiner then rejected claims 1, 3 and 4 under 35 U.S.C. § 103(a) as being obvious and, therefore, unpatentable over Matschke et al., U.S. Patent No. 5,874,741, in view of Kaiser et al., U.S. Patent Application Publication No. 2002/0096648. According to the Examiner, Matschke et al. disclose an apparatus for continuous cold sterilization of

a fluid, as set forth in Claim 1, including at least one ultraviolet radiation source 14 and at least one duct 3, through which the fluid flows, permeable to such radiation. Such “duct” of Matschke et al., the Examiner asserts, has a portion that extends helically about the source (the Examiner making reference to FIG. 2) wherein the helical portion is arranged in a chamber 1. The Examiner also indicates that the walls of the chamber have reflective surfaces (citing column 3, lines 24-25), the distance between the walls and the helical portion purportedly being sufficient to allow circulation of air there between, the Examiner believing the latter to be apparent from FIG. 2 as well as inherent in the elliptical design of the housing combined with the helical shape of the duct.

The Examiner admits that Matschke et al. fail to teach a helical portion of a duct having an elliptically-shaped passage section, the major axis of which is generally perpendicular to the direction of irradiation. He then looks to Kaiser et al. who, he argues, teach a similar apparatus with a UV source 1 surrounded by a helical duct 27, in which the duct has an elliptically-shaped passage section (the Examiner citing paragraph 0027), the major axis of which allegedly is generally perpendicular to the direction of irradiation (purportedly at paragraph 0025). Furthermore, the Examiner takes the position that Kaiser et al. provide motivation for this particular shape of duct, in that attenuation of UV light is avoided (the Examiner again making reference to paragraph 0025). Based on his belief that these teachings are analogous art, the Examiner concludes that one of ordinary skill in the art would be familiar with them and have motivation (based on Kaiser et al.) to combine the teachings of Matschke et al. in order to provide the apparatus of Claim 1. He then finds that it would have been obvious to one

of ordinary skill in the art, at the time the invention was made, to combine the teachings of Matschke et al. and Kaiser et al. to provide the apparatus of Applicant's Claim 1.

With reference to Claim 3, the Examiner argues that Matschke et al. in view of Kaiser et al. teach the apparatus of Claim 1, while acknowledging that Matschke et al. fail to specifically teach a distance between the walls of the chamber and the helical portion of at least about 5 mm (although the Examiner comments that such measurement seems apparent from FIG. 2). He then applies the teachings of Kaiser et al. which, he believes, disclose that the preferred cross-sectional depth of the duct is between 2 and 50 mm, and those of Matschke et al. which, he says, show that the distance between the duct and the chamber wall in FIG. 2 is "clearly" several times the width of the duct. The preferred width of the duct, the Examiner continues, as allegedly taught by Kaiser et al., puts the optimum width at about 25 mm. Hence, the Examiner has determined that if there is even one duct-width between the duct and the wall, the distance between the wall and the helical portion is greater than 5 mm. He explains that the scale of Matschke et al.'s drawing is significant because the purpose of the elliptical chamber walls is purportedly to maximize reflection of UV light back through the duct, a purpose which, he claims, is strongly influenced by geometry. He further believes that the duct dimensions, alleged to be taught by Kaiser et al., are significant because Kaiser et al.'s teachings are directed to a purported optimum duct geometry.

The Examiner concludes, to provide the benefits of both teachings (given that the rejection of Claim 1 above, according to the Examiner, demonstrates that one of ordinary skill in the art would be motivated to do), the scale of Matschke et al.'s drawings may be scaled to the dimensions set forth by Kaiser et al. (the Examiner comments, that by the

above logic, leads to the conclusion of a distance greater than 5 mm valid). It would, therefore, have been obvious, he says, to one of ordinary skill in the art, at the time the invention was made, to set the distance between the walls of the chamber and the helical portion to at least about 5 mm. Doing so, the Examiner asserts, is necessary to receive the benefits of both teachings.

As for Applicant's Claim 4, the Examiner repeats his position indicated above that Matschke et al. in view of Kaiser et al. teach the apparatus of Claim 1. According to the Examiner, Matschke et al. additionally teaches a ultraviolet radiation source that is tubular-shaped (FIG. 2). The Examiner then acknowledges that Matschke et al. does not disclose that the major axis of the elliptical section of the helical portion is generally parallel to the longitudinal axis of the source. So, the Examiner applies Kaiser et al. which, he asserts, teaches a major axis of an elliptical section of a helical portion that is generally parallel to a longitudinal axis of the source (citing paragraph 0025).

Referring to his explanation above with regard to Claim 1, the Examiner finds that one of ordinary skill in the art would have used a duct with an elliptical cross section to obtain the benefits taught by Kaiser et al., and that, for a tubular-shaped ultraviolet radiation source, the major axis of the elliptical section of the helical portion would thus inherently be parallel to the longitudinal axis of the source if the major axis of the elliptical section of the helical portion is to be perpendicular to the direction of irradiation, as purportedly set forth by Claim 1 above. He concludes, for the reasons given in connection with Claim 1, that it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to provide the apparatus of Claim 4.

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Applicant, however, respectfully disagrees with the Examiner's reading and application of the cited references.

First, with regard to Claims 1 and 4, we submit, Kaiser fails to disclose that the elliptically-shaped cross-section of the duct has a major axis that is generally perpendicular to the direction of radiation. Nor does Kaiser provide any motivation for the use, or advantage of implementation, of such a shape. Although the Examiner cites to paragraph 0025 of Kaiser, such application, we respectfully submit, simply is not related to the problem addressed and solved by the shape of Applicant's cross-section. Paragraph 0025 is also unrelated to physics addressed by Applicant's invention, namely, fluid dynamic phenomena in the context of fluid flow through spiral tubes which cause attenuation of the UV radiation. Indeed, Applicant's invention addresses the problem of how to provide complete and effective irradiation of fluid flowing through a duct.

Thus, Applicant believes the Examiner's rejection, in this regard, should be withdrawn.

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Thereafter, the Examiner rejected Claim 2 under 35 U.S.C. § 103(a) as obvious and, therefore, unpatentable over Matschke et al. in view of Kaiser et al., as applied to Claim 1 above, and further in view of Gunn et al., U.S. Patent No. 6,586,172. In particular, the Examiner takes the position that Matschke et al. in view of Kaiser et al. teach all of the limitations of the apparatus described in Applicant's Claim 1, except for air circulation slits formed on the walls of the chamber. He applies Gunn et al. for their alleged teaching of the need to cool the fluid to avoid heat damage to biological fluids, and of air-cooling by a fan as a method of accomplishing this (the Examiner making

reference to column 2, line 66). The Examiner explains that because a fan can only accomplish air-cooling of an area by moving air from a cooler area to the area to be cooled, it would have been common sense and obvious to one of ordinary skill in the art, at the time the invention was made, to form air circulation slits in the walls of the chamber. Doing so, the Examiner reasons, would enable a fan to blow through to cool the liquid. Otherwise, the Examiner notes, the air would be stopped by the chamber, and the fan would be ineffectual.

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Applicant, however, again respectfully traverses the Examiner's reading and application of the above-mentioned references to the present invention.

More specifically, although Gunn et al. purportedly serve as a basis for finding that it would have been obvious to provide a chamber with slits to have a fluid flow circulation in the chamber, not only do Gunn et al. depict an entirely different arrangement than that of Applicant's invention, but, we respectfully submit, there would also be no motivation for one skilled in the art of cold sterilization to apply the invention of Gunn et al. to the teachings of either Matschke et al. or Kaiser et al. Furthermore, we submit, in Gunn et al., the alleged need for slits is dictated by the presence of a fan, which would be ineffective without them. Because Applicant's invention does not use a fan, but rather relies only on slits on the walls of the chamber, there would be no suggestion nor any motivation to combine the teachings of Gunn et al. with those of Matschke et al. or Kaiser et al. as to the need to use both a fan and slits.

Withdrawal of this rejection is, therefore, appropriate.

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Finally, the Examiner rejected Claim 5 under 35 U.S.C. § 103(a) as being obvious and, thus, unpatentable over Matschke et al. in view of Kaiser et al., as applied to Claim 1 above, and further in view of Wong, U.S. Patent No. 7,141,222. Specifically, the Examiner argues that Matschke et al. in view of Kaiser et al. teach the apparatus of Claim 1, except for an indicator light outside the chamber and connected optically to the ultraviolet radiation source through an optical fiber placed either in contact with the lamp or in its vicinity.

The Examiner then looks to Wong for his alleged disclosure of an indicator light 42 outside the chamber of an analogous ultraviolet sterilizer (allegedly set forth in FIG. 1 of Wong). The Examiner admits that Wong does not teach an optical fiber either in contact with the lamp or in its vicinity, but, he argues, does disclose ultraviolet light being received by column 41 and channeled to indicator 42. He explains that optical fibers were “well known in the art”, at the time the invention was made, for channeling light from one place to another. Accordingly, he concludes that it would have been obvious to one of ordinary skill in the art to have used this purportedly “well-known” means of channeling light to deliver the light to column 41.

In support of his position in this regard, the Examiner states that a later invention by Wong (citing U.S. Patent Application Publication No. 2007/0007467 A1, a continuation-in-part of U.S. Patent No. 7,141,222 to Wong), while not prior art, serves as evidence of the obviousness of applying an optical fiber to the indicator. Asserting that an optical fiber is shown applied to an indicator light in FIGS. 7-1, 7-2 and 9, the Examiner takes the position that the use of an optical fiber in Wong’s Published

Application was “clearly obvious” because, he says, it readily occurred to the inventor of the ultraviolet indicator light.

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Similarly as above, Applicant respectfully disagrees with the Examiner’s reading and application of the cited references according to the foregoing rejection.

In particular, unlike Applicant’s invention, Wong is an *indirect* light indicator which converts UV radiation to visible light and compares the color of the converted visible light with a color scale to determine the UV intensity. Also, such a solution is considerably more complex than that proffered by Applicant and, we respectfully submit, is done with entirely different objectives in mind.

Wong does not disclose nor does he suggest that an optical fiber could be used to collect UV light from the lamp and direct it to the outside to simply provide a visual indication as to whether the lamp is “on” or “off”. We respectfully note that, although the Examiner asserts that it was well known to use optical fibers to channel light from one place to another at the time the invention was made, he has provided no evidence of the same, other than a document, namely, Wong, which was filed subsequently.

Moreover, we respectfully submit, the easiest solution for providing a window on the chamber walls was discarded due to the risk to the operator of being exposed to excessive UV radiation, whereas by using an optical fiber, the UV radiation emitted to the outside may be kept at safe levels.

Withdrawal of the Examiner’s rejection under § 103(a) is, therefore, requested.

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Notwithstanding the foregoing rejections, Applicant provides a new Independent Claim of more intermediate scope, namely, Claim 6, without prejudice or disclaimer, for the Examiner's kind consideration.

Applicants have also undertaken to amend the Specification and the Claims, namely, Claim 5, without prejudice or disclaimer, to further comport with U.S. practice and, in so doing, to better define the invention without limiting effect. Specifically, the language that the chamber is "connected optically to" the ultraviolet radiation source is replaced by - - engaged with - -, and the word "placed" after "optical fiber" is deleted as extraneous.

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Applicant respectfully submits that none of the cited references, whether taken alone or in any combination, disclose or suggest Applicant's invention, as claimed. Withdrawal of the Examiner's rejections under § 103(a) is requested.

Applicant has made a good faith attempt to place this Application in condition for allowance. Favorable action is requested.

If there is any further point requiring attention prior to allowance, the Examiner is asked to contact Applicant's counsel at (646) 265-1468.

Respectfully submitted,

Dated: June 23, 2008

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